

CLAIMS

1. An optical recording medium comprising:

a substrate having pits on one face thereof;

a reflective layer formed on the face bearing the pits of the substrate in a

5 manner so as to reflect lands and recesses of the pits; and

a cover layer formed on the reflective layer,

wherein the pit depth d , which is a difference between lands and recesses of the reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n of the cover layer satisfy the following relational expressions,

10 $\lambda/(5n) \leq d \leq \lambda/(3n)$ and $d \neq \lambda/(4n)$.

2. An optical recording medium comprising:

a first substrate having first pits on one face thereof;

a first reflective layer formed on the face bearing the first pits of the first

15 substrate in a manner so as to reflect lands and recesses of the first pits;

a second substrate formed on the first reflective layer, with second pits being formed on a face on the side opposite to the first reflective layer;

a second reflective layer formed on the face bearing the second pits of the second substrate in a manner so as to reflect lands and recesses of the second

20 pits; and

a cover layer formed on the second reflective layer,

wherein the first pit depth d_1 , which is a difference between lands and recesses of the first reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n_1 of the second substrate satisfy the

25 following relational expressions,

$$\lambda/(5n_1) \leq d_1 \leq \lambda/(3n_1) \text{ and } d_1 \neq \lambda/(4n_1),$$

wherein the second pit depth d_2 , which is a difference between lands and recesses of the second reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n_2 of the cover layer satisfy the following relational expressions,

$$\lambda/(5n_2) \leq d_2 \leq \lambda/(3n_2) \text{ and } d_2 \neq \lambda/(4n_2).$$

3. The optical recording medium according to claim 2, wherein the first pits of the first substrate and the second pits of the second substrate are formed by a combination of concave-shaped pits and convex-shaped pits or a combination of convex-shaped pits and concave-shaped pits.

4. The optical recording medium according to claim 3, wherein the first pit depth d_1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d_2 is a difference between lands and recesses of the second reflective layer,

wherein the first pit depth d_1 and the second pit depth d_2 satisfy the following relational expressions, with respect to the refractive index n_1 of the second substrate, the refractive index n_2 of the cover layer and the wavelength λ of signal-reproducing laser light,

$$4n_1d_1 < \lambda < 4n_2d_2.$$

5. The optical recording medium according to claim 3, wherein the first pit depth d_1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d_2 is a difference between lands and recesses of the

second reflective layer,

wherein the first pit depth d_1 and the second pit depth d_2 satisfy the following relational expressions, with respect to the refractive index n_1 of the second substrate, the refractive index n_2 of the cover layer and the wavelength

5 λ of signal-reproducing laser light:

$$4n_2d_2 < \lambda < 4n_1d_1.$$

6. The optical recording medium according to claim 2, wherein the first pit depth d_1 and the second pit depth d_2 satisfy the following relational expression:

10 $d_2 < d_1$.

7. The optical recording medium according to claim 2, wherein both of the first pits of the first substrate and the second pits of the second substrate are formed by a combination of concave-shaped pits or a combination of
15 convex-shaped pits.

8. The optical recording medium according to claim 7, wherein the first pit depth d_1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d_2 is a difference between lands and recesses of the
20 second reflective layer,

wherein the first pit depth d_1 and the second pit depth d_2 satisfy the following relational expressions, with respect to the refractive index n_1 of the second substrate, the refractive index n_2 of the cover layer and the wavelength
25 λ of signal-reproducing laser light,

$$\lambda < 4n_1d_1 \text{ and } \lambda < 4n_2d_2.$$

9. The optical recording medium according to claim 7, wherein the first pit depth d_1 is a difference between lands and recesses of the first reflective layer, and the second pit depth d_2 is a difference between lands and recesses of the second reflective layer,

wherein the first pit depth d_1 and the second pit depth d_2 satisfy the following relational expressions, with respect to the refractive index n_1 of the second substrate, the refractive index n_2 of the cover layer and the wavelength λ of signal-reproducing laser light,

$$4n_1d_1 < \lambda \text{ and } 4n_2d_2 < \lambda.$$

10. The optical recording medium according to claim 2, wherein the second substrate is formed by using ultraviolet-ray curable resin or photo-curing resin.

11. The optical recording medium according to claim 2, wherein at least either the first pits of the first reflective layer or the second pits of the second reflective layer include information for tracking polarity.

12. The optical recording medium according to claim 11, wherein the information for tracking polarity is recorded as winding pit rows.

13. The optical recording medium according to claim 12, wherein the winding of the winding pit rows is formed by frequency modulation.

14. The optical recording medium according to claim 2, further comprising:

a third substrate formed on the second reflective layer in place of the cover layer, and has third pits formed on a face on the side opposite to the second reflective layer, with a refractive index of n_2 ;

a third reflective layer formed on the face bearing the third pits of the third substrate in a manner so as to reflect lands and recesses of the third pits; and

a cover layer formed on the third reflective layer,

wherein the third pit depth d_3 , which is a difference between lands and recesses of the third reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n_3 of the cover layer satisfy the following

relational expressions,

$$\lambda/(5n_3) \leq d_3 \leq \lambda/(3n_3) \text{ and } d_3 \neq \lambda/(4n_3).$$

15. A manufacturing method for an optical recording medium comprising the steps of:

forming a first substrate having first pits on one face;

forming a first reflective layer on the first pits of the first substrate in a manner so as to reflect lands and recesses of the first pits;

forming a photo-curing resin on the first reflective layer;

superposing a transfer substrate having a transfer pit face as one face on the photo-curing resin;

irradiating light toward the photo-curing resin from the transfer substrate side to cure the photo-curing resin so that second pits, obtained by transferring the transfer pit face of the transfer substrate, are formed on the surface of the photo-curing resin;

forming a second reflective layer that reflects lands and recesses of the

second pits; and

forming a cover layer formed on the second reflective layer,

wherein the first pit depth d_1 , which is a difference between lands and recesses of the first reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n_1 of the second substrate satisfy the following relational expressions,

$$\lambda/(5n_1) \leq d_1 \leq \lambda/(3n_1) \text{ and } d_1 \neq \lambda/(4n_1),$$

wherein the second pit depth d_2 , which is a difference between lands and recesses of the second reflective layer, the wavelength λ of signal-reproducing laser light and the refractive index n_2 of the cover layer satisfy the following relational expressions,

$$\lambda/(5n_2) \leq d_2 \leq \lambda/(3n_2) \text{ and } d_2 \neq \lambda/(4n_2).$$